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MONTHLY REPORT - OCTOBER 1980

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LA JOLLA, CALIFORNIA

HONOLULU LABORATORY
LA JOLLA LABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

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STATUS OF PUBLICATIONS

Published

Adams, P. B. 1980. Morphology and distribution patterns of several important species of rockfish (Genus Sebastes). Marine Fisheries Review. Vol. 421(3-4):80-82.

This paper investigates some aspects of the relationship between morphology and distribution of some of the commercially important species of rockfish (genus Sebastes). On the basis of morphometrics, several species pairs of rockfish are suggested. Members of the species pairs are found to be spatially segregated. It is suggested that certain types of adaptive strategies are very important in terms of species that can support commercial fisheries.

Ainley, D. G. and D. P. DeMaster. 1980. Survival and mortality in a population of Adelie penguins. Ecology 61(3):522-530.

Life table and survivorship estimates were calculated for Adelie penguins (Pygoscelis adeliae) of known age, sex, and breeding status. Fledglings had been banded and web-punched in nine consecutive breeding seasons at Cape Crozier, Ross Island. During four later seasons, the returns of 2- to 14-year-olds were recorded. Adjustments for band loss and emigration were made in the data. Results indicate that breeding is risky, especially in the Adelie penguin, and particularly among younger breeders. There is higher mortality among females, and a sex ratio that changes to favor males in the older age groups. The oldest individuals tend to be those that are habitually inept breeders or non-breeders.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

Au, D. W., W. L. Perryman, R. L. Pitman, and M. S. Sinclair. Cetacean populations and equatorial oceanography. Tropical Ocean-Atmosphere Newsletter, No. 4, October 1980.

Composition and concentration of cetacean communities in the eastern and central equatorial Pacific are related to oceanographic factors, notably a relatively weak thermocline gradient and an often absent mixed layer. Eighty-two per cent of the sightings are found to occur east of 145°W, where surface divergence and undercurrent effects eliminate the mixed layer. The composition of the cetacean community and attendant bird populations changes with the development and deepening of the surface mixed layer.

Gunderson, D. R., and W. H. Lenarz (Editors). 1980. Cooperative survey of rockfish and whiting resource off California, Washington and Oregon, 1977: Introduction. Marine Fisheries Review, vol. 42(3-4). Paper (Abstract) presented at a symposium in Seattle, Washington, July 6-7, 1978.

Lenarz, W. H. 1980. Shortbelly rockfish, Sebastes jordani: a large unfished resource in water off California. Marine Fisheries Review, vol. 42(3-4):34-40.

Shortbelly rockfish, Sebastes jordani, appear to be abundant in California waters and present the potential for development of a new large fishery in the area. This paper contains: 1) A description of the biology of the species. 2) First approximations of the effect of fishing on the stock. 3) A review of the rockfish survey results with regard to fishing. 4) A review of the potential for development of a fishery. 5) A discussion of management options for the fishery.

McConaghy, David C. 1980. Measuring sea surface temperature from satellites: A ground truth approach. Remote Sensing of Environment. 10(1):81-84.

Determining the correction for atmospheric attenuation is a major problem in processing thermal infrared digital data from very high resolution radiometers aboard NOAA Polar Orbiting Satellites. An empirical equation for estimating this correction is developed. The coefficients of the equation are determined by using regression techniques and comparing satellite observations to sea surface temperature measurements. Although there is not sufficient data to fully evaluate this procedure, initial satellite measurements are within 0.5°C of independent sea surface temperature measurements.

Approved by Center Director

Balazs, George H. Synopsis of biological data on the green turtle in the Hawaiian Islands. For consideration for publication in NOAA Tech. Memo NMFS-SWFC-7.

Hewitt, Roger. Distributional atlas of fish larvae in the California Current Region: Northern anchovy, Engraulis mordax Girard, 1966 through 1979. For consideration for publication in the Anchovy Atlas.

Matsumoto, Walter M., Thomas K. Kazama, and Donald C. Aasted. Anchored fish aggregating devices in Hawaiian waters. For consideration for publication in Mar. Fish. Rev.

Shomura, Richard S. Japan's fisheries - A current situation report. For consideration for publication in One-third of the World. Pacific Islands Studies Center, Univ. Hawaii, Honolulu.

Translation

Maruyama, Tsutomu. 1980. Report on the southern water skipjack tuna fishery (Nanpō katsuo gyogyō ni kansuru repōto). International Management Association, Tokyo, Japan. Ten pages of text (unnumbered) and 2 pages of figures. (Engl. transl. by Tamio Otsu, 1980, 7 p., Transl. No. 49; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Administrative Reports

Honolulu Laboratory

Kaya, M. 1980. Reproduction of tuna in capitivity, induced spawing, and larval rearing. SWFC Admin. Rep. H-80-13.

La Jolla Laboratory

Coan, A. L., Jr. and E. Weber. 1980. Length and age composition of yellowfin tuna catches from the eastern Atlantic Ocean, 1966 to 1977. SWFC Admin. Rep. LJ-80-13.

Coan, A. L., Jr. and W. Parks. 1980. An evaluation of the status of Atlantic yellowfin tuna stocks based on production model analyses, 1969 to 1979. SWFC Admin. Rep. LJ-80-14.

Evans, R. H. 1980. Comments on the use of water temperature to delimit tropical tuna distributions. SWFC Admin. Rep. LJ-80-15.

Herrick, S. 1980. A framework for evaluating alternatives to present ICCAT management strategies aimed at protecting juvenile Atlantic tunas. SWFC Admin. Rep. LJ-80-16.

Rinaldo, R. G. 1980. Western Atlantic skipjack tuna (Katsuwonus pelamis), evaluation of available fishery and biological data. SWFC Admin. Rep. LJ-80-17.

Rinaldo, R. G. and R. H. Evans. 1980. Western Atlantic tagging program of the United States for the International Skipjack Year Program - cruise report.

Weber, E., W. Parks, and N. Bartoo. 1980. An assessment of the yield per recruit of eastern Atlantic yellowfin (Thunnus albacares) tuna: The impact of the minimum size regulation. SWFC Admin. Rep. LJ-80-19.

HONOLULU LABORATORY

INSULAR RESOURCES INVESTIGATION

Another Research Cruise to Northwestern Hawaiian Islands Completed

Richard N. Uchida, Task Leader of the Insular Ecosystem Study, reported that the NOAA research ship, Townsend Cromwell, returned to Snug Harbor, Honolulu, on October 15 after completing Part II of cruise TC-80-04 to the Northwestern Hawaiian Islands (NWHI). The scientific field party on the cruise included Chief Scientist Waltyer M. Matsumoto, Research Assistants Robert B. Moffitt, Nathaniel Shippen, and Bert Kikkawa, and Statistician Gary L. Kamer.

Matsumoto reported that lobster trapping was particularly good at areas around Necker Island and Maro Reef which had received either little or no effort on past cruises. Moderately good catches were made at Gardner Pinnacles, Brooks Banks, St. Rogatien Bank, and Raita Bank. Shrimp trapping at these islands and banks also yielded varying quantities of caridean shrimp, mostly Heterocarpus ensifer and Plesionika longirostris. Matsumoto also reported that handline fishing for bottomfish was excellent at St. Rogatien and Brooks Banks at depths between 137 and 238 m (75 and 130 fm) where catches were composed mainly of commercially valuable fishes of the snapper-grouper complex, including the red snappers, Etelis carbunculus and E. marshi, the pink snappers, Pristipomoides filamentosus and P. sieboldii, and sea bass, Epinephelus quernus. Trolling was also excellent along the edges of the banks at St. Rogatien, Brooks, and Raita, with kawakawa, Euthynnus affinis, and wahoo, Acanthocybium solandri, constituting the bulk of the catch. The Cromwell also conducted ghost fishing experiments at Necker Island. The preliminary results indicated that lobsters are able to escape from traps and move to other traps.

Fishing Vessel,Easy Rider, Completes Charter for Honolulu Laboratory

The FV Easy Rider returned to Kewalo Basin after completing a charter for the Honolulu Laboratory from October 2-17. The objectives of the charter, a "piggyback" arrangement with the University of Hawaii Sea Grant (UHSG), which utilized the vessel from Honolulu to Midway, were primarily (1) to observe predation by large predators on surface-released berried and sublegal lobsters, and (2) to determine the effect of intensive fishing on a stock of fish and estimate the initial size of the stock at an isolated bank or pinnacle in the NWHI. Chief Scientist James H. Uchiyama was assisted by Fishery Biologist Reginald M. Gooding, Fishery Biologist John J. Naughton of the Western Pacific Program Office, Southwest Region, and Research Assistant Steven H. Kramer.

The preliminary results of the predation experiment indicated there was no predation by sharks, wahoo, and large carangids on surface-released berried and sublegal lobsters.

The intensive fishing experiment was carried out on a "66-fathom deep bank" near French Frigate Shoals. Uchiyama reported that steady fishing pressure was applied over a 4-day period on this bank until there were some indications of a drop in the catch rates. Unfortunately, the experiment had to be curtailed because of rough seas.

Uchiyama also reported that moderate numbers of mackerel scad, Decapterus macarellus, were attracted to the night lights at French Frigate Shoals. Two turtle hatchlings were also observed around the night light there.

Life History Study of Spiny Lobsters Continues

Research Assistant James L. Prescott continued a study on the growth of juvenile spiny lobsters. This study is based on juvenile lobsters sampled at a location off the island of Oahu where juvenile lobsters appear to be very accessible. On four visits to the site in September, Prescott marked 40 Panuliorus marginatus, 15.3 to 37.7 mm in carapace length (CL), 10 P. penicillatus, 13.9 to 39.0 mm CL, and 8 Parribacus sp. Three P. marginatus and one P. penicillatus were recaptured after they molted. The increase in carapace length after the molt was from 12.5% to 14.4% in P. marginatus and 19.3% in P. penicillatus.

Of interest is the fact that all three lobster species coinhabited the same dens. Also, the octopus appeared to have a large effect on the lobster population at the site during the observation period. Octopi were observed to displace the lobsters from their normal resting positions in the dens, and the lobster population in one den appeared to be drastically reduced.

Following the work done by Australian researchers on the relationship between leg length-carapace length and sexual maturity in subadult and adult lobsters, Prescott made measurements on six male and six female P. marginatus juveniles captured at the sampling site. The leg length was regressed on carapace length which provided a good fit to a straight line (males: 1st leg, $r = 0.987$; females: 5th leg, $r = 0.974$). These procedures were also applied to adult lobsters collected around Necker Island during Townsend Cromwell cruise TC-80-02. The data for adult male lobsters showed a reasonably good linear relationship ($r = 0.857$) between leg length and carapace length. The regression lines for juvenile males and that for adult males intersect at approximately 66 mm CL, which is the estimated size at sexual maturity for male P. marginatus. The leg length-carapace length relation for adult females was not as well defined. This may have been due to aberrations in the data, caused, for example, by regenerated legs.

Draft of Manuscript on the Hawaiian Handline Fishery Completed

Dr. Jeffrey Polovina, Statistician, and Stephen Ralston, University of Washington graduate student, completed a manuscript, "A multispecies analysis of the commercial deep-sea handline fishery in Hawaii." In the manuscript, Polovina and Ralston discussed the fit of the Schaefer Production Model to the commercial handline catch and effort data at several levels of data aggregation. Production values for components of the handline fishery were computed and the effects of data aggregation were also discussed.

Catch Rates for Caridean Shrimps Analyzed

Research Assistant Darryl T. Tagami, Computer Aid Lucille Tsukano, and Young Adult Conservation Corps Computer Aid Karen Wendel assisted Richard Uchida in summarizing catch and effort data for deep-water caridean shrimps caught during research cruises of the Cromwell around the NWHI from August 1978 to April 1980. Among the more productive trapping grounds, according to Uchida, is the northwestern sector off Laysan Island where the catch rate reached 448 shrimps/trap-night, and off the western sector of French Frigate Shoals, where it reached 142 shrimps/trap-night. Uchida also reported that shrimp surveys in the NWHI will be intensified on the next few cruises using a sampling design suggested by Dr. Polovina so that a better assessment of the resource can be made.

Wahoo Spawning Study Continues

James Prescott, Research Assistant, processed 10 pairs of wahoo ovaries collected during Part I of Townsend Cromwell cruise TC-80-04. He computed the gonadosomatic index (GSI) for the wahoo and found that they roughly separated into those with a GSI less than 2 and those above 4. Some of the wahoo with a high GSI were apparently spent, although one appeared to be nearing spawning stage. The ovaries from this near-spawning fish will be used to obtain a fecundity estimate.

* * * * * * * * * *

Fishery Biologist Richard Uchida prepared preliminary cruise instructions for TC-81-01, completed the minutes of the Coordinating Council on Research-NWHI meeting, began literature research for a discussion paper on future research in the NWHI, and worked on a preliminary report of the Honolulu Laboratory's ad hoc research vessel acquisition committee. He also worked on the specifications for a contract to field test and evaluate a "dip-stick" version of the enzyme-linked immunosorbent assay (ELISA) for detecting ciguatoxic fishes, continued working on a background document for the Guam/Northern Mariana Islands survey and assessment investigation, and

attended a 2-day planning session, led by Planning Officer David Mackett of the Southwest Fisheries Center, on the survey and assessment strategy for the resource investigation in waters of Guam and the Northern Mariana Islands.

FISHERY MANAGEMENT PROGRAM

Hawaiian Skipjack Tuna Landings Continue Below Long Term Average

The October 1980 Hawaii landings of skipjack tuna were estimated at 64 metric tons (MT), which is 15 MT below the October 1970 landings and 156 MT below the 1964-79 long-term average for October. The cumulative landings from January through October were estimated at 1,253 MT, which is 1,355 MT below the 1979 landings for the same period and 1,021 MT below the 1964-79 long-term average for the same period.

PELAGIC RESOURCES INVESTIGATION

Studies Begun on Navigating Ability of Tunas

Dr. Andrew E. Dizon, Leader of the Pelagic Ecosystem Study, Dr. J. Kirschvink, visiting scientist from Princeton University, and Michael Walker, University of Hawaii graduate student, began investigating the navigating ability of tunas in an effort to understand how migratory animals can navigate accurately over large distances. Recent studies on migratory birds and homing pigeons have revealed that these birds have a surprising ability to sense the geomagnetic field and use it to guide their travels. This geomagnetic "map," which seems to be accurate to within about 5 km over most of the Earth's surface, may be one of the birds' most important sensory tools.

When these magnetic effects were discovered, there was no known biological mechanism through which animals might detect the weak geomagnetic field. Recently, however, a surprising number of animals, including bacteria, honey bees, pigeons, and dolphins, have been shown to synthesize small crystals of magnetite (Fe_3O_4--also known as lodestone). These tiny, microscopic iron-rich particles, which react like simple compass needles to the Earth's magnetic field, may be the key to the sensory mechanism which guides the animal's incredible migratory behavior.

Dizon, Kirschvink, and Walker recently conducted a joint search for similar magnetic crystals in migratory Pacific tuna. For their work, they used the paleomagnetic facilities at the Hawaii Institute of Geophysics, including an ultrasensitive magnetometer using liquid-helium temperature SQUID (Superconducting QUantum Interference Devices), which can detect the presence of less than a nanogram of magnetite anywhere in a tissue sample. Using nonmagnetic plastic knives and pieces of glass as dissecting tools, they found

tens of millions of magnetic crystals in the heads of tunas--enough material to provide tunas with extremely accurate magnetic map senses. In the tunas (yellowfin, skipjack, and kawakawa), the magnetic material was very precisely and repeatedly isolated in or upon the frontal bone of the skull.

This discovery of small biological magnets suggests that a magnetic sense ought to be looked for in these organisms. Walker and Dizon have already discovered an unconditioned magnetic response in the yellowfin tuna.

Detailed Pacific-wide data are available on magnetic lineations on the sea floor and on magnetic storms produced by the solar wind. It would be of interest to determine whether these magnetic parameters affect the distribution and availability of migratory animals.

Kawakawa Show Stress-Related Ovulatory Response Similar to Tuna

Fishery Biologist Thomas K. Kazama reported that kawakawa, Euthynnus affinis, have the same stress-related ovulatory response that was discovered last summer in skipjack tuna, Katsuwonus pelamis. Kazama, Research Assistants Martina K. K. Queenth and Linda Barraclough, and University of Hawaii graduate student Sharon Hendrix demonstrated recently that kawakawa subjected to capture stress, rapidly matured and ovulated. No attempt was made to fertilize the ova artificially because the kawakawa were to be used in other experiments.

LA JOLLA LABORATORY

Coastal Fisheries Resource Division

Division Chief Attends ICES Meeting in Copenhagen, Denmark

Dr. Reuben Lasker, Chief of the Coastal Fisheries Resources Division, attended the International Council for Exploration of the Sea (ICES) meeting in Copenhagen, Denmark, October 6-10. He presented a paper (co-authored with SIO student Jose Pelaez and Dr. R. Michael Laurs) entitled, "The use of satellite infrared imagery for describing ocean processes in relation to spawning of the northern anchovy." This paper was the culmination of intensive work at the Scripps Remote Sensing Facility in March and April 1980, where daily images of surface temperature were captured from the NOAA-6 satellite and analyzed by comparing the pictures with simultaneously gathered ground truth taken by R/V David Starr Jordan.

After the ICES meeting, Dr. Lasker accompanied Robert Marak of the Northwest Fisheries Center, to Szczecin, Poland, to review the activities of the Polish Plankton Sorting and Identification Center. Leonard Ejsymont, Director of the Center, was host to the American delegation.

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Dr. Paul E. Smith left on October 27 for Lima, Peru, at the invitation of West German scientists who are conducting a program of anchovy biomass assessment. Dr. Smith is to consult with them on the use of the new egg production method for assessing the biomass of the Peruvian anchovy.

ALBACORE FISHERIES PROGRAM

Seasonal Variations in Coastal Water Columns Studied

In his analysis of seasonal variation in the California Current (September monthly report), Oceanographer Ronald Lynn examined seasonal means of oceanographic parameters in vertical sections across the Southern California Bight and California Current. Assisted by Oceanographer Ken Bliss, Lynn prepared vertical sections of the differences, January to July and April to October, of the seasonal means of temperatures (see Figure 1), salinity, density of differences (sigma-t), oxygen, and percent saturation of oxygen.

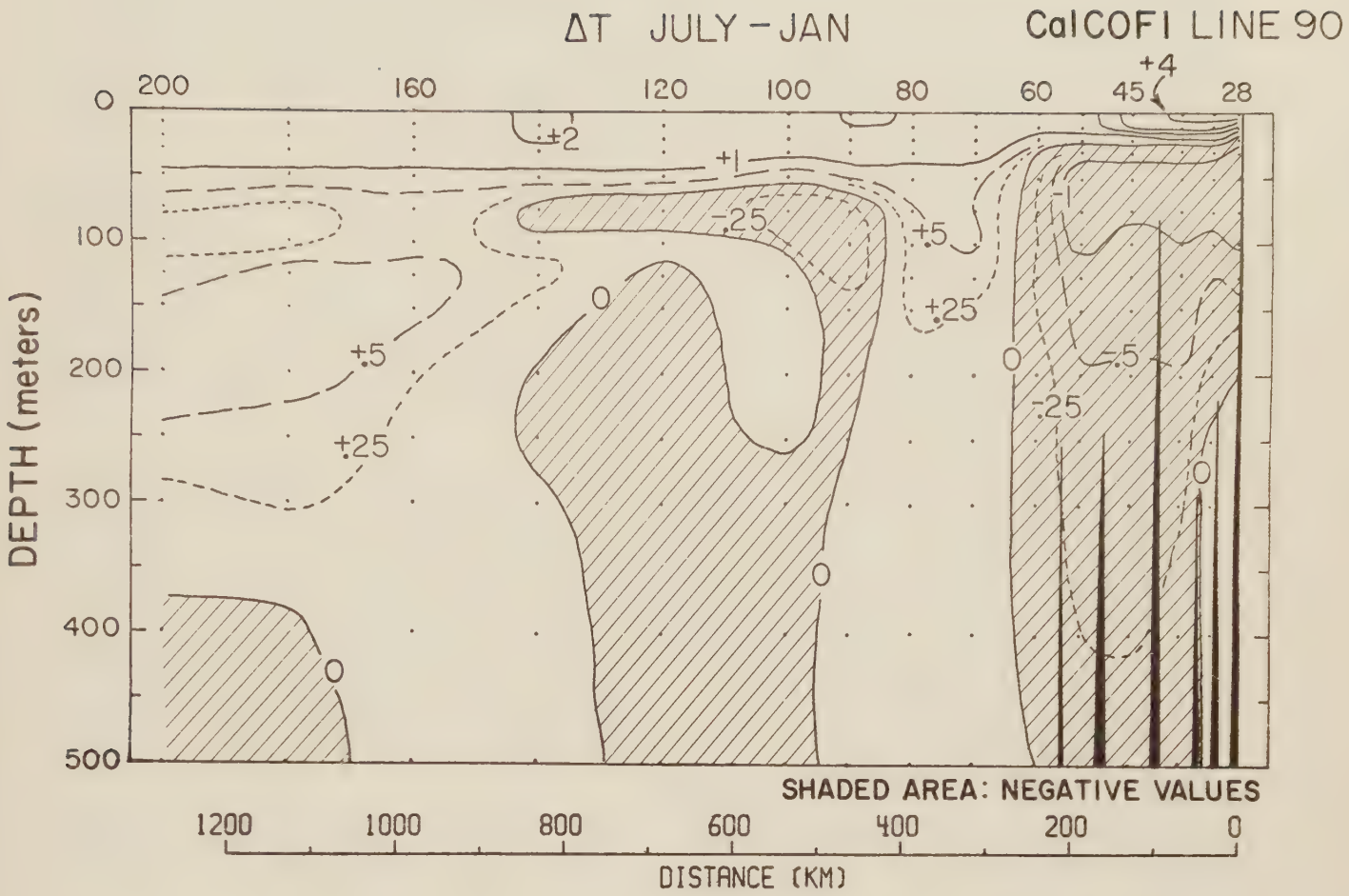

Figure 1. Vertical sections of the differences of the seasonal means of temperatures, from January to July and April to October, across the Southern California Bight and California Current.

These sections of differences reveal a sharp division between the surface layer, where seasonal variations of temperature and density are a result of heat transfer and mixing, and a deeper layer, where seasonal variation of oceanographic parameters results from geostrophic readjustment to seasonal flow patterns. In particular, while warming occurs in the surface layer between January and July, cooling occurs at levels below 25 m within the Bight. Immediately to the west of the Bight, the seasonal warming extends from the surface to considerable depth (observations are limited to 500 m). This pattern of opposing signs of seasonal difference within and outside the Bight (below the surface layer) is found in each of the other parameters. Comparison of these patterns shows that the water column readjusts to attain geostrophic balance to a seasonally varying current field.

The California Current has lower velocities and its core lies farther offshore in January than in July. And the southern California eddy, which is strongly developed during July, is very weak during January. In establishing a new geostrophic balance during the seasonal strengthening of the eddy flow, the isopycnals (lines of constant sigma-t) dome within the center of the eddy. The averages show this vertical displacement to be on the order of 50 meters. The concurrent speedup and eastward displacement of the California Current core depresses distributions outside the Bight. All parameters reflect these changes in the water column.

Lynn created programs for displaying the seasonal averages in station plots of temperature versus salinity and oxygen versus density. For the station at the center of the eddy (90.45), these plots (combining all seasons) fall within a narrow envelope showing very little change (exclusive of the surface layer) in the interrelationship of each parameter. Away from the center of the eddy, the station plots have larger envelopes, which indicates that there is an effect of the varying advection (and mixing) seasonally in altering the characteriestics. In a rough estimate at the shoremost station, 25% of the variation in the seasonal means may be attributable to advection and mixing, and the remainder to geostrophic readjustment.

Lynn presented these results at the Eastern Pacific Oceanic Conference and the annual CalCOFI meeting. The study will be expanded to include other CalCOFI sections, but primary effort will be focused on completing the atlas of seasonal means.

UCSB Graduate Will Study Satellite Data for Albacore Fisheries Program

Randee Recht, graduate of University of California at Santa Barbara with a major in geography and environmental studies, has started work with Dr. Reuben Lasker and Dr. Michael Laurs under a grant from the California Space Institute. She will spend a large part of her time at the Scripps Remote Sensing Facility, collecting and processing infrared satellite data. Her initial project is to process NOAA-6 infrared images collected for the November 1979 albacore/oceanography cruise to complement Ron Lynn's study of

the subtropic front. Recht will also work with Jose Palaez (SIO student on the California Space contract) in handling satellite passes taken during the upcoming CalCOFI cruises.

1980 U.S. Albacore Landings Low for Second Consecutive Year

Relatively poor fishing success marked the U.S. albacore fishery for the second consecutive year in 1980, according to Dr. Michael Laurs, Leader of the Albacore Fishery Program. Landings through October are estimated to total a little over 8,000 tons. This is only slightly higher than the total landings made in 1979, and considerably below the seasonal 10 year average of about 23,000 tons.

There appear to be a number of factors contributing to the low landings of albacore in 1980 including: 1) the late arrival of the northern substock of fish into waters off the Pacific Northwest, 2) the failure of the fishery to develop fully off southern and central California despite an initial early appearance of fish, 3) the low availability of 12 to 15 pound (5.5 to 6.8 kg) fish off California south of Cape Mendocino (this size of fish normally makes up a significant portion of the U.S. catch), 4) fish not biting, in particular in the Cortes Bank and San Juan Seamount areas and off central California, and 5) high winds and rough seas hampering fishing effort, notably off California.

Some of the most consistent catches during the 1980 season were made during the last half of October. A fleet of approximately 75 to 100 jig and baitboats operated in the area centered approximately 140 miles off the coast between Pt. Sur and Pt. Arena. Catches were generally 1/2 to 3/4 tons per day for jigboats and 1 to 5 tons per day for baitboats, with top daily scores of about 1 ton for jigboats and 9 tons for baitboats. The fish caught were large, ranging mostly between 25 to 35 pounds (11.4 to 15.9 kg), with some fish over 50 pounds (22.7 kg) being landed. The catches were reported to have been made in waters with sea surface temperatures of 60 to 61°F (15.6 to 16.1°C). Provided that weather conditions do not deteriorate, the outlook for continued fishing in this area is good.

NOAA Research Associate To Study Chemoreception in Anchovy

Dr. Colin Barnett, the 1980-1981 NOAA Research Associate at the La Jolla Laboratory, is investigating the responses of the northern anchovy to a variety of odors derived from food substances and from conspecifics. In the first phase of the experiments, odors are introduced into circular pools in known configurations. The behavior and position of the anchovy in the pool are then monitored with video cameras. If the anchovy can respond to odor (or taste), they should alter their behavior, perhaps by demonstrating increased circling and filter-feeding, and by converging on the point of odor introduction.

Later next year, Barnett will attempt to condition anchovy to various odors. Conditioning experiments can effectively test the sensory limitations of laboratory animals, but caution must be used in extrapolating to the wild. Dr. Barnett will also consider the effect of substituting unconditioned anchovy into schools of conditioned ones; such a project can reveal the ways in which school members communicate with one another.

The second phase of Barnett's experiments will examine chemoreception in larval anchovy. As with the adults, the behavior of the larvae will be monitored in response to the introduction of odors. In order to classify larval behavior, Barnett will use the results of an earlier study by Dr. John Hunter of the La Jolla Laboratory which described the feeding behavior of larval anchovy.

Anchovy feed at night. The peak spawning activity of anchovy also occurs at night. Therefore, it is highly likely that both feeding and reproductive activities are mediated at least in part by chemical cues. Barnett's studies are a first step towards understanding the role of chemoreception in the biology of the northern anchovy.

Clupeoid Fish Study Postponed

Dr. John Hunter reports that his trip to Bellagio, Italy, to work on a review of the biology of Clupeoid fishes with John Blaxter of Scotland, has been postponed because Dr. Blaxter has contracted hepatitis.

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Dr. Hunter attended an EPA-sponsored workshop in Menlo Park, California, designed to provide guidance on future research directions for EPA-supported studies on UV effects on the marine ecosystem.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Anchovy Biomass Estimation Study Continues

Susan Picquelle, Statistician, continued her study of the 1977-1980 anchovy trawl survey data. A code for lunar cycle was introduced in order to examine the effect of moon phase on spawning activity. A two-way contingency table was constructed in which the row classification was "phase of the moon" and column classification was "spawning condition of females." The chi-square test suggests that a significant relationship exists between these two factors. However, regional effects may be confused with lunar cycle effects, because trawls that are close together in time (i.e., same phase of the lunar cycle) are also close together in space (i.e., same region) due to the sampling procedure of the trawl survey. The next step, therefore, is to examine regional effects.

1981 Egg/Trawl Cruises Discussed

Dr. Gary Stauffer convened the first planning meeting for the 1981 egg/trawl cruises on October 15. Attendees included Dr. Paul Smith, Dr. John Hunter, Bev Macewicz, Alec MacCall, Susan Picquelle, and Jim Thrailkill. In addition to reviewing cruise schedules, the group discussed sources of errors and biases in parameter estimation for the egg production equation. Similar issues were covered in an October 14 meeting between SWFC scientists and Dr. Frank Hester, who has been employed by fishing industry representatives in Southern California to testify on technical matters pertaining to stock assessment.

Federal Anchovy Quota Discussed at Sacramento Meeting

In response to a request from California Fish and Game Director C. Fullerton, Dr. Daniel Huppert, Alec MacCall, and Dr. Gary Stauffer attended a California Fish and Game (CF&G) Commission meeting in Sacramento on October 2. The Commission was seeking additional technical guidance pertinent to its earlier establishment of a 15 thousand-ton reduction fishery quota for the 1980-81 anchovy fishing season. Stauffer gave a detailed presentation on the alternative biomass estimates and MacCall discussed the likely impact of this year's Federal anchovy quota (i.e., 166 thousand tons) on the stock. The Commission seemed to favor a change in their quota policy to support the established Federal quota, but a final vote on this will not occur until the November CF&G Commission meeting.

First Leg of Sablefish Research Cruise Completed

Dr. Gary Stauffer participated in the first leg of the NMFS/CFG/SIO sablefish cruise on the R/V Chapman. The cooperative, 40-day cruise is being conducted by the NMFS Northwest and Alaska Fisheries Center, the California Department of Fish and Game and the University of California's Scripps Institution of Oceanography. In preparation for the cruise, Stauffer worked with Jim Hardwick and Jim Phelan of CF&G to purchase 50 used sablefish pots for an escapement ring study. Escapement rings were welded into the Korean, conical style pots with the help of Bill Brinkerhoff and Steve Baumle of SWFC. These gear are to be fished primarily during the second leg of the sablefish cruise, while the first leg was devoted to an index of fish abundance.

To develop an abundance index, standardized rectangular pots were fished at 6 depths: 225, 300, 375, 450, 550 and 700 fathoms. Each set of gear was made up of 10 pots fished 5 times at each depth for 24 hours. A total of 1651 sablefish were caught. Preliminary results showed the greated concentrations occurred at the 300 and 375 fathom depths. By the third replicate, catch rates dropped to about half of those on the first set. According to Chief Scientist Steve Hughes of the Northwest and Alaska Fisheries Center (NWAFC, Seattle), these catch rates were comparable to those achieved at the northern

test sites. The average fish size, however, was smaller in the south, and the fish size seemed to increase with depth fished.

The only incidental species caught in significant numbers was the black gill rockfish, Sebastes melanostomus. These were taken at the 225, 300 and 375 fathom depths, and ranged in weight from 1/2 to 4 pounds.

Although a small fishery for sablefish (or black cod) has existed off California for more than 50 years, this resource has only recently come under intense fishing pressure by U.S. fishermen, who export the fish, primarily to Japan. Serious trapping by U.S. fishermen began in 1977, after the 200-mile limit (established in 1976) excluded foreign ships from U.S. coastal waters. The sablefish is taken in the eastern Pacific from the Aleutian Islands near Alaska, south to Cedros Island off the coast of Baja California. The U.S. industry, however, is concentrated around Monterey, California.

About 90-95% of the U.S. catch is exported to Japan, where sablefish is a highly-prized delicacy. A good harvest of other fish species by the Japanese, and too many fish on the market, caused the price of sablefish to drop sharply last year, casting doubt on the future potential of the U.S. sablefish industry. Scientists on the Chapman cruise hope to shed some light on the problem by studying the relative abundance and possible migration patterns of the sablefish.

Larvae of Four Species of Rockfish Found in CalCOFI Plankton Samples

Fishery Biologist John MacGregor reports that four species of rockfishes have been identified as larvae from CalCOFI plankton samples for the years of 1956, 1966, 1969, 1972 and 1975. The occurrence of the larvae of these four species delimits their spawning seasons, since almost all of the larvae were very small and recently spawned.

The percent (larval occurrence) by month for all rockfish and each of the four species was:

Month	All rockfish	S. paucispinis	S. levis	S. jordani	S. macdonaldi
Oct-Dec	6.0	5.2	0.0	0.1	0.6
Jan	19.8	40.1	45.5	13.5	10.4
Feb	29.5	28.7	19.9	65.4	28.8
Mar	19.3	18.4	18.3	16.4	28.1
Apr	10.8	4.8	14.0	3.9	31.5
May	4.9	2.5	1.1	0.6	0.6
Jun-Sep	9.7	0.3	1.2	0.1	0.0

Sebastes paucispinis and S. levis (3.3% and 0.28% of all rockfish larvae, respectively) are the two earliest spawners with more than 45% of the spawning over by the end of January. S. jordani (10.4% of all rockfish larvae) more closely follows the pattern of all rockfish, with peak spawning in February.

S. macdonaldi (0.68% of all rockfish larvae) has a very late spawning season, with no marked peak and about equal amounts of spawning in February, March, and April.

Coastal Resources Scientists Attend Annual CalCOFI Meeting

This month scientists from the Coastal Resources Division of the La Jolla Laboratory attended the 1980 annual meeting of the California Cooperative Fisheries Investigation (CalCOFI) held in Idyllwild, California, under the auspices of the Scripps Institution of Oceanography. Highlighting the meeting was a symposium on "Low Frequency Events in the California Current," and a popular roundtable discussion of the state of California fisheries, chaired by Herbert Frey of the California Department of Fish and Game.

Scientists from institutions as far away as La Paz, Mexico, and Seattle, Washington, presented papers and joined in discussions. The following papers were presented by SWFC personnel:

Devonald, K. - "Prey distributions and the feeding success of jack mackerel larvae."

Eber, L. - "Evolution of large scale surface temperature anomalies in the northeast Pacific Ocean."

Hewitt, R. - "Speciation and convergence in the California Current."

Hunter, J. R. and R. Leong - "The spawning energetics of female northern anchovy, Engraulis mordax."

Lasker, R., J. Pelaez and R. M. Laurs - "The use of satellite infrared imagery for describing ocean processes in relation to spawning of the northern anchovy, Engraulis mordax."

Leob, V. J. , H. G. Moser and P. E. Smith - "Seasonal and geographical patterns of ichthyoplankton distribution in the CalCOFI area, 1975."

Lynn, R. - "Variability in ocean characteristics of the California Current from a new CalCOFI atlas."

MacCall, A. - "A theory of Clupeoid spawning geography."

MacCall, A., K. Parker, R. Leithiser and B. Jessee - "Power plant impact assessment: A fishery production model approach."

Methot, R. - "Growth rates of larval fishes in the Southern California Bight."

Smith, P. - "Anchovy/sardine; cold/warm?"

Stauffer, G. and S. Picquelle - "Estimates of the 1980 spawning biomass

of the central subpopulation of northern anchovy."

Sumida-MacCall, B. and G. Moser - "Comparative notes on food and feeding of bocaccio (Sebastes paucispinis) and Pacific hake (Merluccius productus) larvae in the California Current."

The Southwest Fisheries Center will host next year's conference.

Oceanic Fisheries Resources Division

TUNA/BILLFISH RESOURCES PROGRAM

Working Documents Prepared for the 1980 ICCAT Meeting

Working papers are in the final stages of preparation by Tuna/Billfish Resources Program staff for presentation at the meeting of the Standing Committee on Research and Statistics (SCRS) of the International Commission for the Conservation of Atlantic Tunas (ICCAT) to be held November 3 to 11, 1980, in Madrid, Spain. Authors and titles of the working papers are:

Bartoo, N. - An updated stochastic spawner/recruit relationship for North Atlantic albacore.

Coan, A. and E. Weber - Length and age composition of yellowfin tuna catches from the eastern Atlantic Ocean, 1966 to 1977.

Coan, A. and W. Parks - An evaluation of the status of Atlantic yellowfin tuna stocks based on production model analyses, 1969 to 1979.

Evans, R. - Comments on the use of water temperature to delimit tropical tuna distributions.

Herrick, S. - A baseline economic analysis of surface tuna fishing activity in the eastern tropical Atlantic Ocean.

Rinaldo, R., R. Evans and P. Vergne - Preliminary results of a 1980 skipjack tuna tagging cruise in the western Atlantic and Caribbean Sea.

Weber, E., N. W. Bartoo, and W. Parks - An assessment of the yield-per-recruit of eastern Atlantic yellowfin (Thunnus albacares) tuna: the impact of the minimum size regulation.

Pacific Fishery Management Council Approves Billfish/Oceanic Shark Management Objectives

The Pacific Fishery Management Council Billfish and Oceanic Shark fishery management plan development team, led by Fishery Biologist Jim Squire, met with members of the Council's Billfish/Oceanic Shark advisory panel on October 2 at the California Fish and Game headquarters. Long Beach, California. The objectives of the Fishery Management Plan (FMP) were discussed in detail and the Team and Advisory Panel came to an agreement on five plan objectives. Plan objectives were subsequently presented to the Pacific Council at its October 8-9,1980, meeting in Renton, Washington, by Fishery Biologist Jim Squire, and Ed Martin, recreational fisherman and Chairman of the Advisory Panel. After discussion, the Council approved the following objectives for the Billfish and Oceanic Shark FMP:

1. Reduce vessel conflict and congestion between recreational and commercial fleets.

2. Encourage the use of energy-efficient fishing methods for commercial and recreational fishing.

3. Develop ways of accomplishing the following goals with a minimum of detriment to the user groups:

   a. Increase recreational participation opportunities;

   b. Increase net economic returns to the commercial sector;

   c. Increase the flow of fish to consumers at low prices.

4. Collect an adequate data base to more accurately define and understand the nature and extent of the fisheries resources.

5. Limit management regulations to those necessary for the effective management of the commercial and recreational fisheries.

MARINE MAMMAL ASSESSMENT AND MONITORING PROGRAM

New Computer Program - PROJECTS - Developed for Review of Estimates of Porpoise Mortality

As part of an effort to review estimates of porpoise mortality, a generalized ration estimation computer program has been developed by Bruce Wahlen, Ken Wallace, and Susan Boyer. This program incorporates the sampling

and estimation algorithms developed by Dr. Nancy Lo, and produces various ration based estimates of total kill and their variances, which account for the cluster sampling aspects of the tuna boat observer samples. The program includes several very general subprograms which may be of interest to other researchers.

Aerial Photography Experiment Initiated with Inter-American Tropical Tuna Commission

SWFC and the IATTC began a cooperative aerial photographic study of porpoise schools off the coast of Mexico, designed to obtain high resolution photographs which will allow measurement of lengths of animals. The field work will continue into December. LCDR Wayne Perryman of the NOAA Corps and Computer Specialist Frank Ralston are participating for SWFC.

Visitation by Dr. David Ainley

Dr. David Ainley, Senior Researcher at Point Reyes Bird Observatory, consulted with Dr. Doug DeMaster here for a few days on the demography of Adelie Penguins. The data resulted from 7 years of observations made on the survivors of 45,000 birds tagged as chicks over a 10-year period. The analysis, part of a monograph nearing completion, will have important implications in the growing controversy over how the depletion of whales has affected the Antarctic marine ecosystem.

In the course of the work, DeMaster familiarized Ainley with data-needs and potential future problems in a similar demographic study on elephant seals now underway at the Farallon Islands. Ainley also conferred with Dr. David Au on how seabird communities can be used to characterize and identify oceanographic domains in the tropical Pacific, and discussed seabird-tuna-porpoise interactions. Both topics are part of Ainley's current research. Dr. Ainley also spoke with coastal marine mammal personnel of DF&G and SWC on assessment techniques for California Sea lions (re: sea lion-squid fishery interactions).

MARINE MAMMAL BIOLOGY AND TECHNOLOGY PROGRAM

Program Initiated To Correct Manufacturing Problems With Dolphin Disc Tag

The staff of the Tagging and Tracking Project, led by Fishery Biologist Jaqueline Jennings, has been developing a testing program with the Plastics Laboratory of the Naval Surface Weapons Lab in White Oak, Maryland. Jennings reports that the Naval facility is evaluating the dolphin disc tag mold and

will correct the mechanical problems with the mold and the molding technique which were responsible for the inferior quality of the last batch of tags. The lab has proposed certain structural changes in the tag design to strengthen the tag, and will select plastics appropriate for the design and suitable to the marine environment. Tests will be conducted with tag samples of various plastics. This should finalize the dolphin disc tag design and result in written instructions for future production.

18-Month Data Being Analyzed For Tursiops Tooth-Layer Monitoring Project

Fishery Biologist Al Myrick is processing samples and analyzing data received under contract with Hubbs/Sea World Research Institute for half of the 3-year project, monitoring tooth-layering rates in 12 captive bottlenose dolphins. Myrick reports that the annual layering rate continues to be constant for all of the animals despite varying water temperature, salinity, food intake, and physical activity. Findings show an intrayear reduction in the tissue-deposition rate in late fall-winter, with a sudden increase in accumulation in late spring-early summer.

The age-specific layer thickness in all project animals occurs with incredible uniformity. If subsequent teeth collected in the project show a continued uniform rhythm of accumulation, Myrick will be able to determine ages from teeth of bottlenose dolphin with reasonable accuracy.

Time-Layer Base-line Data Developed for Stenella spp.

Dr. Myrick also reports that retrospective studies of tetracycline labels in teeth of seven Hawaiian spinners held captive by Sea Life Park in Hawaii have resulted in the development of a genus-specific dental layer formula calibrated for real time for Stenella spp. Medical records provided by the oceanarium show tetracycline treatments of the dolphins date back as long as eight years. Tetracycline labels, seen as yellowish bands under the fluorescent microscope, were found through their numbers and relative spacing in the dental tissue, to correspond almost perfectly with the treatment dates. Using a map of these bands superimposed on a pattern map of the layered tissue, Myrick has been able to define time layers and compute layering rates.

Teeth from dolphins of the genus Stenella associated with the yellowfin tuna fishery in the eastern tropical Pacific display the same layering patterns as those of Hawaiian spinners. The dental layer formula developed from the Hawaiian spinner dolphin study will be used in the determination of the age composition of the mortality samples representing the eastern and whitebelly spinner and the spotted dolphin stocks of the fishery.

Marine Mammal-Fisheries Interactions Report Received

The first annual report from the California Department of Fish and Game detailing the results of the July 1979 to June 1980 survey of marine mammal interactions with the fisheries of California has been received by Jim Coe, Fishery Biologist, who is also a co-contracting officer for the contract. The study, jointly funded by SWFC and the Southwest Region, is scheduled to run for two years, and will produce a thorough assessment of the extent of marine mammal involvement in fisheries, both in terms of losses to fishermen, and in the incidental and intentional take of mammals. These results are expected to help identify those species and stocks which need increased attention in determination of their condition.

The primary objective of the first year of this survey was to estimate fish and gear loss in the commercial salmon fisheries of central and northern California. The findings show that the California sea lion (Zalophus californianus) is the animal most often involved with fisheries activities, usually through removal of catch from hooks or nets. The harbor seal (Phoca vitulina) is occasionally involved in rivermouth and sheltered water fisheries. The second and final year of this survey will concentrate on gathering data in the salmon fisheries that will allow testing of the validity of shoreside interview data, and on assessing interactions in the various gillnet fisheries, the roundhaul fisheries for anchovy, mackerel, etc., the Klamath River salmon gillnet fishery, and the southern California squid fisheries.

TIBURON LABORATORY

FISH COMMITTEES INVESTIGATION

Study Continues on Communities of Reef-Fishes in the Northwestern Hawaiian Islands

The research vessel Easy Rider this month ended a cruise to the reef-fish communities on those Northwestern Hawaiian Islands not visited on earlier cruises. Investigation Leader Dr. Edmund S. Hobson, with Fishery Biologist Tony Chess, continued a study of variations in community structure which relate to differences in habitat throughout the Hawaiian archipelago. Expanding earlier findings to include Gardner Pinnacles, Laysan Island, Maro Reef, Lisianski Island, and Pearl and Hermes Atoll, they collected data which support generalizations made in a preliminary report presented by Hobson at the Northwestern Hawaiian Islands Symposium in Honolulu last spring. A clearer understanding was gained of certain species which are prominent on High Island reefs, becoming progressively less numerous to the northwest as habitats change with increased latitude, age, and exposure to prevailing wind and sea. As predicted, certain species which apparently depend on features related to basaltic reefs, were found to be dominant only on the Gardner Pinnacles--the last basaltic reef to the northwest. Study was also made of an opposing pattern, where species low in numbers on the High Islands are dominant in the Northwestern Islands. For example, Caranx ignobilis, whose low numbers on High Island reefs probably stem from fishing pressures, proved even more abundant on the islands visited during this cruise (Figure 1), than on those visited earlier, probably because these islands are even more isolated from fishermen.

Earlier studies had noted the great abundance of Myripristis spp. in the Northwestern Islands. These fish reside in reef caves by day, and feed in the water column above the reef and surrounding regions at night. The relatively low numbers of these fishes on High Island reefs today was attributed to pressures from human fishermen, but on two of the Northwestern Islands, Laysan and Lisianski, Myripristis spp. were found to be fewer than on any of the more heavily-fished High Islands. This is true even though both of these islands offer seemingly widespread suitable habitat and fishermen are essentially absent. But both islands have had large numbers of monk seals, which conceivably could have exerted fishing pressures that decimated the Myripristis populations. Monk seals feed at night, and Myripristis spp. are generally the most numerous moderate-sized fish (e.g., 100-200 mm SL) in open water above Hawaiian reefs after dark.

In addition to their reduced numbers of Myripristis spp., the reef communities at Lisianski were notable for a general absence of small diurnal planktivores, like Chromis vanderbilti and Chromis hanui, which are numerous at islands to the north as well as to the south. There may be a relationship between the general absence of these small fishes and the occurrence in the

Figure 1. This school of jacks, Caranx ignobilis, at Maro Reef, illustrates the great numbers of this important gamefish in the Northwestern Hawaiian Islands. In contrast, large individuals of this species are now rare around the major Hawaiian Islands, probably due to intense fishing pressure.

water there of exceptionally high loads of suspended sediments (reportedly a common condition). Our visit occurred during an especially calm period, but even then the levels of sediments in suspension were high compared to elsewhere in the archipelago. In contrast to the general absence of small planktivores, the file fishes, Cantherhines verecundus, and especially Pervagor spilosoma, were unusually abundant. P. spilosoma is widespread throughout the archipelago, but usually a community includes just a few individuals. At Lisianski, however, this was one of the predominant species. Perhaps related to its unusually large numbers, and to the general absence of small planktivores, P. spilosoma at Lisianski commonly occurred in aggregations above the corals, feeding on plankton (Figure 2)--an unusual habit for file fishes, and one never before seen in P. spilosoma by members of this investigation.

On the reefs at Lisianski it was also noted that relatively large numbers of the surgeonfish, Ctenochaetus strigosus, were diseased (Figure 3). This condition, which involved discolorations, ulcers, and tumors on the body, was seen in no other species, but occurred in up to 5% of the C. strigosus on some reefs. Symptoms like this, when noted in fish populations, routinely are attributed to pollution of the environment by humans. But their occurrence at this island, which is among the most isolated from human contact of all the Hawaiian Islands, may be due to natural circumstances.

FISHERIES DEVELOPMENT INVESTIGATION

Fisheries Development Cruise Completed

The chartered commercial trawlers, Sanibel and Candi-B returned to the Tiburon Laboratory on October 4, 1980, after fishing for four days between Monterey and Half Moon Bay, California. Cruise Leader Sus Kato and William Leet were aboard the Sanibel, and Lt. Patrick Rutten (NOAA Corps) and Bruce Wyatt (University of California Sea Grant) were aboard the Candi-B. About 4,300 pounds of shortbelly rockfish were caught with a "semi-pelagic" trawl used by Candi-B. The net uses conventional bottom trawl doors, but the bottom of the net remains about three feet off the seafloor. The chief reason for using this type of net is to allow fishermen to catch shortbelly rockfish without having to invest in costly equipment needed for midwater trawling. The objective was to determine if a small-mesh semi-pelagic trawl could effectively catch shortbelly rockfish while avoiding large catches of other species. About 550 pounds of incidental species, or 15 percent of the shortbelly catch, were caught when the vessel fished on echo sounder marks believed to represent shortbelly rockfish. With conventional midwater trawls, incidental catch can be kept to less than five percent. Further fishing trials are needed to learn if the lower rate can be obtained with the semi-pelagic trawl.

The Sanibel encountered difficulty in finding concentrations of fish, probably due in part to a faulty fathometer. Further, the net-monitoring

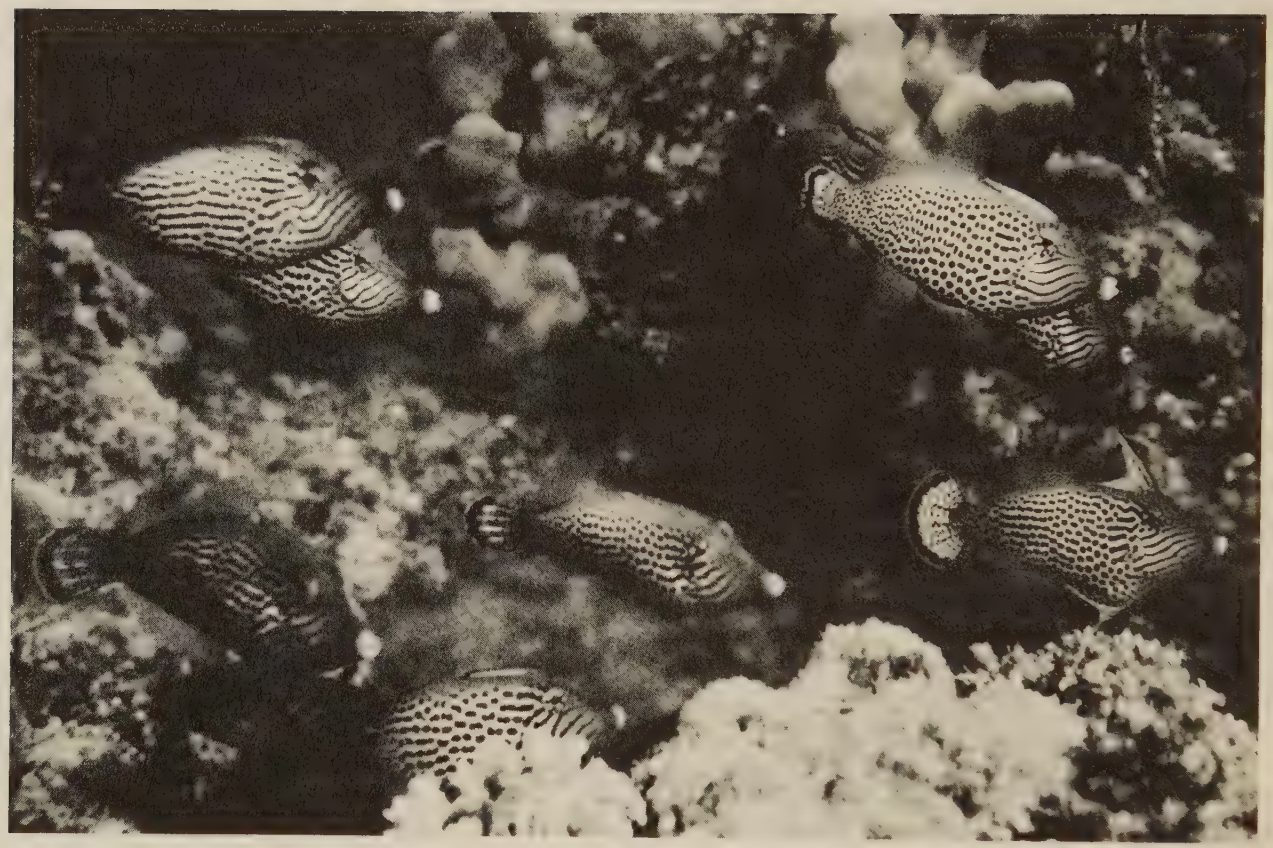

Figure 2. These file fish, Pervagor spilosoma, clustered above a coral head at Lisianski Island, are feeding on plankton in a manner more typical of certain planktivorous damselfishes, which are generally absent from these reefs.

Figure 3. A diseased surgeonfish, Ctenochaetus strigosus, at Lisianski Island.

system failed to operate properly, so it was impossible to fish effectively with a midwater trawl. One of the cruise objectives was to fish the same schools with both nets to learn differences in selectivity.

About 50 pounds of Euphausia pacifica were taken with a large plankton trawl aboard Sanibel. The size range was suitable for the domestic aquarium fish food trade, which now uses imported freeze-dried euphausiids. Further fishing trials are needed to establish expected catch rates, and the prospective ex-vessel value to fishermen.

Shortbelly rockfish caught during the cruise will be sent to Japan for market evaluation, and to a domestic pet food manufacturer, after a larger quantity is accumulated. The Laboratory will work with a Monterey, California, fisherman and processor to provide several container loads of shortbellies for these purposes.

Generally, both shortbelly rockfish and euphausiids were not as abundant during the cruise period, compared to other times of the year.

Groundfish Plan Nears Completion

Industrial Economist Edward Ueber chaired two meetings of the Groundfish Plan Management Team at the Tiburon Laboratory on September 30-October 1, 1980, and at Seattle, Washington, on October 7-9, 1980. At the first meeting, which was also attended by personnel of the Northwest Region, most of the problems remaining in the Groundfish Plan were addressed and resolved. After the second meeting of the Team, Ueber presented the proposed changes in this Plan to the Pacific Fishery Management Council, its Scientific and Statistical Committee, and the Groundfish Advisory Sub-Panel. A decision was made to hold further public hearings before final approval of the Plan by the Council.

Following the meetings, Ueber resigned from the Team to devote more time to project activities.

PHYSIOLOGICAL ECOLOGY INVESTIGATION

Research Conducted Under Marine Sanctuaries Act 202 Funding

Dr. Jeannette A. Whipple of the Tiburon Laboratory and Nina Hirsch, San Francisco State University, gave presentations on research being done under funding from the Marine Sanctuaries Act 202 at a meeting in Boulder, Colorado, October 21-24, 1980. The research contract is entitled: "Impact of Estuarine Degradaton and Chronic Pollution on Populations of Striped Bass in San Francisco Bay-Delta." The purpose of the presentations was for project review, presentation of a modified proposal for renewed funding (Fiscal Year 1981), and to participate in the preparation of a plan for long-term effects research managed by OMPA.

Striped Bass Data Interpretation and Entry

Dr. Whipple and Biological Technician Michael Bowers are working on the completion of data interpretation and entry for serum proteins measured in striped bass, and on histological slides of mature and immature ovaries in striped bass. Both sets of data from striped bass were collected in the field during 1980.

Striped Bass Data Sets Nearing Completion

Data Clerk Rahel Fischer is working with Dr. Whipple and other members of the Physiology staff on the completion of all data sets for 1978-1980, of field collections of striped bass. The large data base on approximately 400 fish will be completed within the month of November for keypunching and statistical analyses and interpretation.

Annual Report Prepared on Marine Sanctuaries Act 202 Research

An Annual Report is being prepared on the Marine Sanctuaries Act 202 research for submission to OMPA (November 15, 1980). Results and recommendations extracted fromn this report are also being summarized for presentation to Pete Chadwick, California Department of Fish and Game, Stockton, for an upcoming meeting, to discuss the status of the striped bass population, and possible means of taking action to counteract the continued decline in this population. The meeting will be held sometime in November.

Histopathological Effects of Benzene on Striped Bass Juveniles Studied

Changes were required in the experimental design of a study on the histopathological effects of benzene on striped bass juveniles. Exposure systems were changed from semi-state to continuous flow, and larger aquaria were used. Animals are currently being acclimated before being exposed to 5.0, 1.0, and 0.1 ppm aqueous benzene. All organ systems are to be sampled periodically, and will be examined for pathological conditions induced by the benzene. Karen Taberski, a graduate student at San Francisco State University, will use this study for her dissertation research.

PACIFIC ENVIRONMENTAL GROUP

FISHERY/ENVIRONMENTAL MODELING AND FORECASTING

Bakun Attends IOC/FAO Cooperative Program Meetings in Rome

Andrew Bakun, Oceanographer, returned this month from Rome where he served as a consultant to the Intergovernmental Oceanographic Commission (IOC) in meetings held at FAO. The meetings concerned the development of a background paper and initial project proposals for OSLR (Ocean Sciences in Relation to Living Resources). In addition to participating in the meeting, Bakun was able to make contact with experts on Canary Current fishery biology and assemble important information for the eastern boundary current comparisons underway at PEG.

SOUTHWEST REGIONAL DATA MANAGEMENT AND ADP OPERATIONS

Successful ORION Sea Trial Completed

Lt. Mark Sullivan, NOAA Corps, reported a sucessful sea trial of the ORION (Oceanographic Research Interactive Onboard Network) system aboard the R. V. David Star JORDAN, during Leg I of CalCOFI cruise 8010 in October. The system, which will remain aboard the JORDAN, is running under a CalCOFI executive operating program which displays and logs station activity and navigation data. Real time interaction and communication between navigator's and scientists's remote terminals are also performed.

The automatic reading of sea surface temperature and salinity from the ship's thermosalinograph was added during Leg I of the cruise, while several program logic errors were discovered and alleviated by rewriting sections of the operating program. This data is collected when the network is cued to log an occupied station. As with all other station activity and navigational data, the temperature and salinity are written to tape in the standard CalCOFI 80 character card images. The data will be transferred to UCSD computers via the Northstar/Meca system at the La Jolla Laboratory.

Coastwide Data Reports Generated

Computer Programmer Robert Butler generated reports from the Coastwide Data Files for Stacy C. Hall, Economist for the Pacific Fishery Management Council (PFMC), for the development of the Salmon Plan. The Coastwide Data System was created from 1974, 1975, and 1976 data from California, Oregon, and Washington, and consists of merged vessel files for each year, merged landing files for each year, a vessel data base, and six landings data bases. The aggregated statistical reports that were generated included:

1) Number of vessels landing salmon by year and for all years, by state and for all three states (Washington, Oregon, California).

2) Same as (1), by gear-type used to land salmon (e.g. troll, seine, gillnet).

3) Same as (1), by combination of species caught (e.g. salmon alone; salmon and crab; salmon, crab and blackcod; etc.).

4) Combination of (2) and (3).

5) Same as (1), by types of gear carried on board (e.g. troll only; troll and longline; troll, longline and gillnet; etc.).

Butler also completed the refinement of the entry/report programs for the Pacific Area Cooperative Enforcement System (PACES) and is writing the general documentation for the system. PACES is a cooperative enforcement system among the SWR, SWC, and California Fish and Game.

FY 80 Financial Reporting System Reports Completed

The FY 80 FRS reports for the SWC and SWR were completed and the data were transferred to tape for archiving. The FY 81 data base files have been implemented for the SEC and SWR. The implementation includes a monitor which identifies the requestor/location for costing purposes. The following two modifications to the Center's FRS will be developed for the FY 81 FRS:

1) Revision of the arithmetic schedule for producing the Reserve on the "Center" report

2) The production of the Multi-Task Document (MTD) report.

Confer System Implemented

Dorothy Roll, delegated the Conference Manager, has implemented part of the NMFS Southwest Conference (CONFER) System. CONFER is an electronic mail system that can send information to several locations. Use of this CONFER will begin in mid-November when attendees from La Jolla, Hawaii, Tiburon, and Monterey laboratories, and the Southwest Region, enter and receive messages.

Dorothy Roll represented Fred Kellenberger at the National Data Management Committee meeting, which was held at the Northeast Fisheries Center, Woods Hole, Massachusetts, from October 15-17. A major decision at the meeting was to combine the efforts of the Southeast, Northeast, and Southwest Fisheries Centers in requesting the procurement of the mini-computer systems at each site.

* * * * *

John Davies, Computer System Specialist, entered on duty in October from the Northeast Center. He is stationed in the SWR, Terminal Island, and will be responsible for the development and implementation of computer systems at the SWR.

MISCELLANEOUS

NOAA AGENCIES IN SAN DIEGO MARK DECADE OF DISCOVERY AT OPEN HOUSE

The National Oceanic and Atmospheric Administration (NOAA), created within the U.S. Departmet of Commerce in 1970 to expand the use of ocean resources and to monitor and predict conditions in the atmosphere, ocean, and space, was 10 years old on October 3, 1980. To mark the birthday, NOAA agencies in San Diego--The National Weather Service, the National Ocean Survey, the Environmental Data and Information Service, and the National Marine Fisheries Service's Southwest Fisheries Center and Southwest Region--sponsored Open House celebrations for two days: Friday, October 3, and Saturday, October 4, 1980, at two locations, the Southwest Fisheries Center in La Jolla and the David Starr Jordan, docked for this occasion at the Broadway Pier in San Diego.

Visitors to the Fisheries Center saw fisheries displays, weather instrumentation, marine mammal exhibits, live pelagic fishes, larval fish displays, plankton collecting nets and samplers, models of the principal tuna species studied as well as recently caught specimens, a model of a tuna purse seine net, and other examples of specialized gear and equipment used on research survey cruises. A film on fisheries activities was shown hourly.

The Southwest Regional Office of NMFS had an exhibit on the fisheries resources affected by the implementation of the Fishery Conservation and Management Act, which established a 200-mile fisheries zone off the coasts of the United States. Their field office in San Diego was represented by an exhibit on the work of NMFS biological technicians who go to sea aboard U.S. tuna purse seiners to collect information on the porpoise/tuna interaction.

The National Weather Service, which has more than 300 NWS offices throughout the country to disseminate weather information, put together an exhibit of current weather maps and handouts. Jim Steiner and his staff of meteorologists from the San Diego office provided an explanation of the services offered nationally by NWS.

Several of the laboratories at the Center could be seen in actual operation. Each exhibit was attended by NMFS scientists and technicians who explained their work to visitors.

During the two-day Open House, estimated attendance at the Center was about 700 persons and almost 1,500 at the David Starr Jordan.

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A. Ms. Kandhy Franklin and members of her fifth-grade class at Hill Creek School in Santee, CA, pose for NMFS photographer Ken Raymond at the conclusion of their Open House visit to the Center.

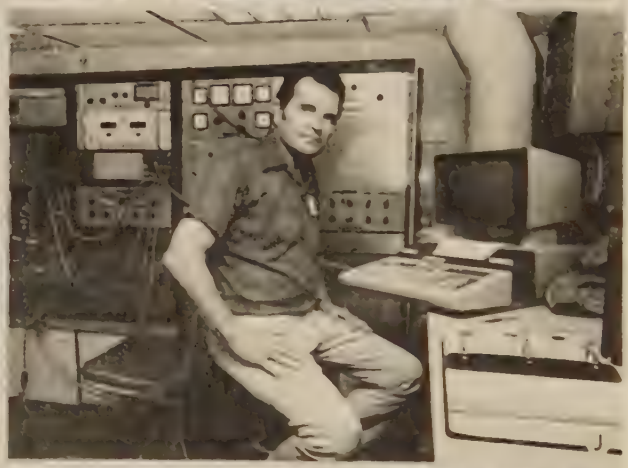
B. Sarah and Becky Rinaldo, 5-year-old twin daughters of NMFS fishery biologist Ron Rinaldo, examine the skull of a northern elephant seal, part of the marine mammal exhibit.

C. View of exhibits set up in the front courtyard as seen from the second floor balcony of the Center.

D. Seated visitors give rapt attention to showing of a film, "Tuna seining and porpoise safety," produced by the Tuna/Porpoise Management Branch of the Southwest Region.

E. Young visitor and his father admire calico bass in the aquarium exhibit. In the background (left) are Biological Technicians Ray Stives and Larry Hansen.

F. Visitor looks at sample of plankton captured by bongo nets (exhibited in upper left of photograph) employed during CalCOFI research surveys.



G. Some of the 1,500 visitors to the David Starr Jordan.

H. Open House guests in wheel room of the David Starr Jordan.

I. Lloyd Farrar, Marine Operations Supervisor (left), talks with reporter and cameraman from KFMB, TV-Channel 8, San Diego.

J. Captain Milt Roll of the Jordan with the terminal for the ORION system, the NMFS's new onboard computer network. The ORION network collects data from the Jordan's shipboard sensors on things as plankton, sea temperature and salinity, and integrates it with ship navigational information on speed and position.

K. Lt. Commander Roger Hewitt of the NOAA Corps explains the function of the nation's seventh uniformed service to an interested visitor.

L. Jim Steiner, the head of the National Weather Service office in San Diego, explains meteorological charts to Open House guests.

PUBLIC RELATIONS

Honolulu Laboratory

NOAA Tenth Anniversary and "Year of the Coast" Observances Held on Oahu and Neighbor Islands

In observance of NOAA's tenth anniversary and the "Year of the Coast," personnel from the Honolulu Laboratory and the Townsend Cromwell participated in a series of open houses on Oahu, Molokai, Maui, and Kauai.

The observance on Oahu was called the "Aloha Tower Festival" and involved other marine-oriented agencies and commercial enterprises in Honolulu, in addition to the Honolulu Laboratory and the Townsend Cromwell. The "Aloha Tower Festival" which was held on October 19, featured 7 vessels, 57 exhibits, a water show, and 5 musical groups. Approximately 10,000 people attended the event and an estimated 4,500 visitors toured the Townsend Cromwell.

On the neighbor islands, open houses were held on the Townsend Cromwell which included displays of scientific activity at the Honolulu Laboratory. The visitor counts at the open houses were: 773 at Kaunakakai, Molokai, on October 28; 2,005 at Kahului, Maui, on October 29; and 1,367 at Port Allen, Kauai, on October 31.

HONORS AND AWARDS

Tiburon Laboratory

Delores M. Fussy, Secretary, received a Quality Step Increase.

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New Technical Writer/Editor at La Jolla Laboratory To Help Scientists Prepare Papers for Publication

This month Shari Sitko began work as a technical writer/editor at the Southwest Fisheries Center. For the next 4 months, she will assist Center scientists in preparing manuscripts and final drafts for publication. She will also help Lillian Vlymen, the Center's Technical Writer/Editor, edit and prepare the Center's monthly report, write press releases, and edit other Center reports and proposals.

Sitko received her Master's degree in Biology in 1979 from San Diego State University, where her course work concentrated on marine ecology, animal behavior, and art. Her thesis research compared avian populations in disturbed and natural areas of San Diego Mission Bay, before and after the Bay area was developed for recreation. As a graduate student,she spent a semester working at Scripps Institute of Oceanography under the Sea Grant Program.

Sitko returned to California after a year in the doctoral program in Environmental Communication at the University of Michigan, Ann Arbor. While there, she scripted and directed videotapes promoting energy conservation workshops, supervised a class in self-publishing, and co-authored a book on media-use for community and grass-roots organizations.

SEMINARS

La Jolla Laboratory

October 14 - Dr. Colin Barnett, National Research Council/NOAA Post-doctoral Research Associate at Southwest Fisheries Center, spoke on "Determinants of larval behavior in a cichlid fish."

October 17 - Dr. Jurgen Alheit, German Agency of Technical Cooperation and Instituto del Mar del Peru, gave a talk on "Food and feeding relationships of the fish in the subtropical lagoon in Bermuda."

Tiburon Laboratory

October 22 - James R. Chess, Tiburon Laboratory, spoke on "An overview of research goals and techniques used in establishing baseline data in fish community investigations," at a seminar held at Sonoma State University.

October 29 - Dr. Leonard J. V. Compagno, Adjunct Professor of Biology, San Francisco State University, discussed "The diversity of the shark world" at a joint San Francisco State University/Tiburon Laboratory seminar.

PRESS RELEASES

Honolulu Laboratory

October 17 - "Research vessel completes cruise to Northwestern Hawaiian Islands."

October 20 - "Tagged albacore recaptured off Hakalau, Hawaii."

October 22 - "Animals may use tiny 'magnets' to navigate."

La Jolla Laboratory

October 17 - "Fishery scientist to cooperate in study of sablefish resource."

TRAINING

Honolulu Laboratory

October 15-16 - William G. Gilmartin attended the Merit Pay Appraisal Training Program at Salt Lake City, Utah.

La Jolla Laboratory

October 15-16 - Dr. Izadore Barrett, Director, attended the Merit Pay Appraisal Training Program at Salt Lake City, Utah.

Tiburon Laboratory

October 21-22 - Lt. Patrick J. Rutten, Safety Officer, and Walburga L. Giguere, Admininstrative Officer - Safety Training for Supervisors; National Safety Council, San Rafael, CA

October 27-28 - Walburga L. Giguere, Administrative Officer - Factor Evaluation System of Position Classification. OPM - San Francisco, CA.

VISITORS

Honolulu Laboratory

October 3 - Kitty Simonds and Justin Rutka, Western Pacific Regional Fishery Management Council, visited Director Richard Shomura to discuss Council matters.

- Dr. James Shaklee, University of Hawaii, visited R. Shomura to discuss a proposal prepared jointly by Dr. Shaklee and Dr. Richard Brill, Pacific Gamefish Foundation, to be submitted to the University of Hawaii Sea Grant Program.

9 - Dr. D. Devaney and Mrs. B. Birch, of the Bernice P. Bishop Museum, inspected the Honolulu Laboratory's fish and invertebrate collection.

10 - Gertrude I. Nishihara, newly appointed member of the Western Pacific Regional Fishery Management Council, visited to familiarize herself with the Honolulu Laboratory's research effort.

20 - Ramon Rechebei and Toshiro Paulis, Trust Territory of the Pacific Islands, and Richard Howell, Guam, visited R. Shomura to discuss fishery matters.

October 23 - Dr. Rick Grigg, Hawaii Institute of Marine Biology, University of Hawaii, discussed squid research with Richard Uchida, Dr. Jeffrey Polovina, and James Uchiyama.

28-29 - Dave Mackett of the Southwest Fisheries Center, La Jolla Laboratory, participated in the planning session for the survey and assessment of the marine resources of Guam and the Northern Mariana Islands.

29 - Addie Mattox of The Mattox Group, Pasadena, California, visited the Honolulu Laboratory to discuss word processing and telephone systems with George Liao and Richard Shomura.

31 - Dr. Jed Hirota, Hawaii Institute of Marine Biology, University of Hawaii, met with Dr. Andrew Dizon and Richard Shomura to discuss possible projects regarding deep-sea mining.

La Jolla Laboratory

October 4 - John Walker, Port Elizabeth Munic., South Africa.

October 6-7 - D. Chapman, L. Eberhardt, and P. Dayton, members of the Marine Mammal Commission, to review the Tuna/ Porpoise program.

October 7 - Walburga Giguere, NMFS, SWFC, Tiburon Laboratory.

- Margaret Lazanoff, NMFS, SWFC, Pacific Environmental Group.

- Mary Lynn Godfrey, NMFS, SWFC, Honolulu Laboratory.

- H. J. Dodimead, Department of Fisheries and Oceans, Pacific Biological Statio, Nanaimo, British Columbia, Canada.

October 9 - Howard Fraley, NOAA, NASO, Seattle, WA.

- Gary L. Worthern, Utah State University.

24 - Lee Stevens, State Department, Washington, D.C.

- Dr. Richard Parrish and Donna Millicoate, Pacific Environmental Group.

27-30 - Dr. David Ainley, Point Reyes Bird Observatory, Pt. Reyes, CA.

28 - Lewis Scarpace and Kay Raleigh, U.S. Department of Labor, Occupational Safety and Health Administration, San Francisco, CA.

Pacific Environmental Group

October 7 - Dr. Percy Wickett, DFO, RSB, Nanaimo, B.C., Canada.

10 - Lt. H. Soldi (Peruvian Navy), Naval Postgraduate School, Monterey, CA.

Tiburon Laboratory

October 2 - Joseph J. Cech, University of California, Davis, CA.

6 - Richard Nishioka, University of California, Berkeley, CA.

- Nurney Richman, University of California, Berkeley, CA.

7 - Alan Ford, Southwest Region, Terminal Island, CA.
9 - Michael Watson, Environmental Protection Agency, Seattle, WA.

10 - Robert J. Wagner, Oceanic Society, San Francisco, CA.

16 - Ben and Robert Gold, Commercial Fishermen, Walnut Creek, CA.

- Robert Kanter, Marine Biological Consultants, Inc., Costa Mesa, CA.

- Ronald C. Miracle, Marine Biological Consultants, Inc., Costa Mesa, CA.

- Fred Piltz, Bureau of Land Management, Los Angeles, CA.

- Michael L. Sowby, Marine Biological Consultants, Inc., Costa Mesa, CA.

20 - Keith R. Anderson, California Department of Fish and Game, Menlo Park, CA.

- Howard Smalheiser, College of Marin, Kentfield, CA.

21 - Chris Dewees, University of California, Davis, CA.

22 - John R. Hall, Office of Habitat Protection, Washington, D.C.

27 - Rick Breitenbach, U.S. Fish and Wildlife Service, Sacramento, CA

- Judd Howell, Golden Gate National Recreational Service, San Francisco, CA.

- John Sabella, Pacific Fishing Magazine, Seattle, WA.

- Anne West, Inverness Association, Inverness, CA.

28 - Beth Okamura, Department of Zoology, University of Berkeley, CA.

29 - Phillip L. Glenn, Fishing Vessel Candi B, Eureka, CA.

- Serge Doroshov, University of California, Davis, CA.
- George Monaco, University of California, Davis, CA.
- Richard Nelson, University of California, Bodega Marine Laboratory, Bodega Bay, CA.

MEETINGS AND TRAVEL

Honolulu Laboratory

October 1 - Director Richard Shomura returned to Honolulu after attending the Southwest Fisheries Center Management Meeting in La Jolla.

2 - Dr. Andrew Dizon represented R. Shomura at a Hawaii Department of Transportation meeting for all Kewalo Basin tenants to discuss the future use of that area.

3 - R. Shomura met with Jay Puffinburger, Hawaiian Tuna Packers, and John Robey, Tuna Boat Owners Cooperative, Inc., to discuss the submission of a joint proposal to the Pacific Tuna Development Foundation.

3 and 15 - R. Shomura attended the Sea Grant Advisory Council meetings in the Honolulu Laboratory conference room.

14 - Director Richard Shomura, Dr. Michael Adams, Dr. Jerry Wetherall, Heeny Yuen and Howard Yoshida attended a meeting of the billfish plan development team in the Honolulu Laboratory conference room.

21-22 - R. Shomura attended the Pacific Tuna Development Foundation Board of Director's meeting at the Hawiian Regent Hotel.

23 - R. Shomura and Walter Matsumoto attended a meeting on fish aggregating devices in the Honolulu Laboratory conference room.

30 - Architect Kimball Thompson and his staff of engineers met with staff members of the Honolulu Laboratory and Western Pacific Program Office to clarify a number of points raised in the early efforts of a feasibility study on the construction of a new wing for the Honolulu Laboratory building.

La Jolla Laboratory

October 2 - Dr. Daniel Huppert, Dr. Gary Stauffer and Alec MacCall went to Sacramento, CA where Stauffer and MacCall presented testimony on the status of the anchovy stock to the California Fish and Game Commission.

- Wes Parks, Sam Herrick and Jim Squire traveled to Long Beach, CA, to attend a meeting of the Billfish FMP Development Team and Council Billfish Advisory Sub-panel.

3-10 - Dr. Reuben Lasker traveled to Copenhagen to attend an ICES meeting.

6- 7 - Dr. Gary Sakagawa participated in the Marine Mammal Commission Review of the Tuna-Porpoise Program.

6- 8 - Deputy Director John Carr traveled to Boulder, CO, to attend a NMFS Vessel Committee meeting.

6- 9 - Dr. Izadore Barrett, Center Director, attended a Pacific Council SSC meeting in Seattle, WA.

6- 8 - Jim Squire traveled to Seattle, WA, to attend a PFC meeting and to discuss FMP objectives to be used by the Team.

6-10 - Dr. David Au, Dr. Robert Owen, Dr. Michael Laurs, Ken Bliss, Lawrence Eber and Ron Lynn traveled to Lake Arrowhead, CA, to attend the 1980 annual meeting of the Eastern Pacific Oceanography Council.

9-10 - David Mackett went to Seattle, WA, to attend a State-Federal meeting and visit to NWAFC for a planning meeting.

14 - Alec MacCall, Dr. Gary Stauffer and Susan Picquelle met with Frank Hester, who has been retained by the fishing industry to study SWFC biomass estimation methods.

14-16 - Dr. Izadore Barrett traveled to Salt Lake City, UT, to attend a Merit Pay training course.

14-17 - David Mackett attended a NMFS Planners meeting in Washington, D.C.

- Dr. Reuben Lasker went from Copenhagen to Szeszin, Poland, to review a plankton-sorting center.

- Dr. Gary Sakagawa attended a U.S.-ICCAT Advisory

meeting in Washington, D.C.

- Dorothy Roll traveled to Woods Hole, MD, to attend the National Data Management Committee meeting.

20-23 - The following SWFC personnel attended the CalCOFI Conference in Idyllwild, CA: Dr. Izadore Barrett, Center Director, Dr. Colin Barnett, Kim Devonald, Lawrence Eber, Roger Hewitt, Dr. John Hunter, Susan Iacometti, Carol Kimbrell, Dr. Reuben Lasker, Dr. Nancy Lo, Ron Lynn, Eric Lynn, Alec MacCall, Barbara Sumida-MacCall, Rick Methot, Dr. Jeff Moser, Dr. Robert Owen, Susan Picquelle, Nelson Ross, Elaine Sandknop, Ted Saur, Dr. Paul Smith, Betsy Stevens, and Gail Theilacker.

21 - Dr. Norman Bartoo traveled to Long Beach, CA, to meet with California Fish and Game biologists.

21-30 - Dr. Gary Stauffer participated in the sablefish survey aboard NOAA's R/V Chapman.

26-31 - Dan Gittings traveled to Washington, D.C. to attend a Federal Interagency Field Librarians' Workshop.

- Dr. Izadore Barrett traveled to Washington, D.C. to attend the RD/CD/OD meeting.

27 - Dr. Paul E. Smith went to Lima, Peru, to consult with West German scientists on methods of assessing biomass of Peruvian anchovy.

27-30 - David Mackett traveled to Honolulu, HI, to attend a planning session for the Central and Western Pacific survey.

27-31 - Dr. Bill Perrin traveled to Washington, D.C. to attend an IATTC meeting as an observer for the International Whaling Commission.

- Dr. Gary Sakagawa attended the 38th meeting of the IATTC in Washington, D.C.

28 - Mark Sullivan, Oden Burris, Rich Charter, and Dorothy Roll traveled to Los Angeles, CA, to attend the INTERFACE West '80 Computer Conference.

28-31 - Dr. Daniel Huppert, Sam Herrick and Jane McMillan traveled to Avalon, CA, to attend an annual workshop and business meeting of the Western Association for Valuation of Ecosystems.

29 - Mark Sullivan and Fred Kellenberger attended a Fishery Information Network meeting in Long Beach, CA.

29-30 - Dr. John Hunter attended a UV effects workshop in Menlo Park, CA.

Pacific Environmental Group

October 6- 8 - Margaret Lazanoff traveled to La Jolla, CA, to attend the Administrative Management meeting.

8-10 - Dr. Douglas McLain, Dave Husby, and LCDR Craig Nelson traveled to Lake Arrowhead, CA, to attend the EPOC meeting.

10-24 - Andrew Bakun traveled to Rome, Italy, to serve as a consultant to the Intergovernmental Oceanographic Commission (IOC).

20-24 - Dr. Richard Parrish and Donna Mallicoate traveled to Idyllwild, CA, to discuss a contract with Fred Kellenberger.

21-24 - Gunter Seckel traveled to Seattle, WA, to attend the Climate Diagnostic Workshop, and to confer with NASO and the Department of Oceanography personnel at the University of Washington.

29 - Dr. Douglas McLain traveled to Santa Cruz, CA, to confer with D. Garrison at the University of California, Santa Cruz, and to Tiburon, CA, to see M. Freiburtshausen at San Francisco State University.

Tiburon Laboratory

September 30-October 1 - Edward Ueber chaired a meeting of the Groundfish Plan Management Team, held at the Tiburon Laboratory.

6- 7 - Director Norman J. Abramson attended a Pink Shrimp Management Plan Development Team Meeting of the Pacific Fishery Management Council in Seattle, WA.

7- 8 - Walburga Giguere traveled to the Southwest Fisheries Center, La Jolla, CA, to attend an Administrative Meeting concerning financial, procurement and personnel matters.

7- 9 - Edward Ueber traveled to Seattle, WA, to chair a meeting of the Groundfish Plan Management Team, and to present the newest version of the Plan to the Pacific Fishery Management Council.

7-10 - Dr. Edmund S. Hobson participated in the Reef-Fish Workshop, St. Thomas, Virgin Islands, sponsored by the Southeast Fisheries Center. The workshop gathered together researchers in this field to discuss the development of a reef-fish program by the Southeast Center.

15 - Sus Kato and William Leet traveled to Monterey, CA, to discuss plans for experimental fishing for euphausiids and shortbelly rockfish with fishermen and a processor. They also collected fish for the Hawaii Laboratory's Open House exhibit.

15-17 - Dr. R. Bruce MacFarlane traveled to Terminal Island, CA, to attend a workshop on Section 301(h), Technical Evaluation Report Review (sponsored by the EPA).

16-17 - Lt. Patrick Rutten (NOAA Corps) and Susan Pollock traveled to Fort Bragg, CA, to meet with Steve Schultz (California Department of Fish and Game), Bruce Wyatt (University of California Sea Grant), and Dana McQuaid (commercial fisherman). The topic of the meeting was the development of an octopus fishery on the northern California coast.

21-24 - Dr. Jeannette A. Whipple gave a presentation on research being done under funding from the Marine Sanctuaries Act 202 at a meeting in Boulder, CO.

27 - Director Norman J. Abramson, Sus Kato and Edward Ueber met at the Tiburon Laboratory with John Sabella, Pacific Fishing Magazine, Seattle, WA. Mr. Sabella is preparing an article for the magazine on commercial fishing industries in the San Francisco Bay area.

28-31 - Edward Ueber, current President of the Western Association of Valuation of Ecosystems (WAVE), and Director Abramson traveled to Avalon,CA, to attend the Annual Meeting.

PERSONNEL

Honolulu Laboratory

October 5 - Henry M. Kishinami, Biological Aid (Fisheries) - Extension to complete 700-hour appointment.

20 - Dennis L. Kees, Biological Aid (Fisheries) - Appointment under Stay-in-School Program.

29 - Eric P. Knudtson, Wildlife Biologist - 700-hour appointment

La Jolla Laboratory

October 1 - Elizabeth Hubert, Clerk Typist - Temporary Appointment.

October 6 - Shari Sitko, General Biologist - Temporary Appointment

October 19 - Bill Brinkerhoff; LWOP. Brinkerhoff will return to duty 11-16-80.

October 29 - Sandra Hawes, Biological Aid - Temporary Appointment

Tiburon Laboratory

October 6 - Susan M. Pollock, Biological Aid - Temporary Appointment.

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